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Forecasting the Yield and Price of Cotton. By HENRY LUDWELL MOORE. (New York: The Macmillan Company. 1917. Pp. vi, 173. \$2.50.)

In this the most convincing of his books Professor Moore gives us another illustration of the fruitful application of the Pearsonian coefficient of correlation to economic problems. He states that his chief object "has been to make a contribution to economic science by showing that the changes in the great basic industry of the South which dominate the whole economic life of the Cotton Belt are so much a matter of routine that, with a high degree of accuracy, they admit of being predicted from natural causes" (p. 10). Without question he has succeeded. In particular he has shown (1) that forecasts of the yield of cotton made from the current reports of the Weather Bureau as to rainfall and temperature in the states of the Cotton Belt are more accurate than the forecasts of the Department of Agriculture and (2) that from the prospective magnitude of the crop more precise forecasts of the price per pound of cotton can be made than the Department of Agriculture now makes in forecasting the yield of the crop.

The author's conclusions, just stated, are reached after a careful analysis involving the application of the theory of correlation. That application has been effectively made. However, the author has a mistaken confidence in the *variate difference correlation method*. He refers to it (p. 130) as "the method that is freest from theoretical objections when applied to such limited series as we are compelled to work with." In applying it Professor Moore finds "a remarkable agreement between the correlations of ratios and the correlations of first differences and of second differences" (p. 131). Karl Pearson, under whose direction the method was developed, recommends that one go to sixth or higher differences before reaching a conclusion. My own investigations indicate that the *variate difference method* is particularly *unreliable* for short series. (See *Quarterly Publications of the American Statistical Association*, June, 1917.)

In a number of instances computations are carried out to needless refinement. For instance in table 6 (p. 70) the squares and products of items are carried out to two decimal places when units are sufficient. Again in table 32 (p. 144) the percentage changes in the price and production of cotton lint are given to hundredths of a per cent. Thus the average price per pound of upland cotton in 1904 was 8.7 cents and in 1905 it was 10.9 cents or a change of

+ 2.2 cents. Professor Moore gives the percentage change of 1905 over the preceding year as + 25.29 per cent. This is certainly spurious accuracy. Further, why should correlation coefficients for twenty pairs of items be given to thousandths when the probable error would affect the hundredths place? There appears to be no reason for stating coefficients of correlation to three places in economics other than that such is the usage in biology. Certainly, our conclusions are not based on the digit in the thousandths place. Where the original data are admittedly rough, as they are in this case, such refinements in computations are excessive. They create suspicion of rather than confidence in the results. In the present case these excesses of computation are not the basis of false conclusions.

Forecasting the Yield and Price of Cotton is an admirable piece of work. Professor Moore has demonstrated his thesis.

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NEW BOOKS

ELDERTON, W. P. *Frequency curves and correlation. Addendum, with diagram, and errata.* (London: Layton. 1917. Pp. 22. 1s. 6d.)

RUGG, H. O.: *Statistical methods applied to education; a textbook for students of education in the quantitative study of school problems.* (Boston: Houghton Mifflin. 1917. Pp. 410. \$2.)

The Canada year book 1916-17. (Ottawa: Census and Statistics Office. 1917. Pp. 720. \$1.)

Official year book of the Commonwealth of Australia, containing authoritative statistics for the period, 1901-1916, and corrected statistics for the period 1788 to 1900. (Melbourne: Commonwealth Bureau of Census and Statistics. 1917. Pp. xl, 1198.)

Statistical year book, Province of Quebec. (Quebec: Provincial Secretary's Department, Bureau of Statistics. 1917. Pp. xi, 555.)

Statistical year book of the Kingdom of Siam, 1916. (Bangkok: Department of Commerce and Statistics, Ministry of Finance. 1917. Pp. 285.)

Resumen annual de estadistica municipal, ano XIV, 1916. (Montevideo: Direccion de Censo y Estadistica. 1917. Pp. 351.)